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Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of claims:

1. (currently amended) A storage device, comprising:

a first semiconducting layer having a p-dopant, ~~said first semiconducting layer~~;

a second semiconducting layer having an n-dopant, said second semiconducting layer disposed on said first semiconducting layer;

a junction formed between said first and said second semiconducting layers;

a charge trapping structure disposed on said second semiconducting layer; and

a conductive gate, wherein said conductive gate and said charge trapping structure move relative to the other, wherein an electric field applied across said second semiconducting layer and said conductive gate traps charge in said charge trapping structure.

2. (original) The storage device in accordance with claim 1, further comprising a substrate, wherein said first semiconducting layer is disposed on or in said substrate.

3. (original) The storage device in accordance with claim 2, wherein said substrate further comprises a p-doped substrate, wherein said first semiconducting layer is disposed in said p-doped substrate.

4. (original) The storage device in accordance with claim 2, wherein said substrate further comprises a doped substrate having a dielectric layer disposed on said doped substrate, and wherein said first semiconducting layer further comprises an epitaxial p-doped semiconductor layer formed on said dielectric layer.

5. (original) The storage device in accordance with claim 4, wherein said second semiconducting layer further comprises an epitaxial n-doped semiconductor layer formed on said epitaxial p-doped semiconductor layer.

6. (original) The storage device in accordance with claim 2, wherein said substrate is either a semiconductor substrate or an inorganic substrate.

7. (original) The storage device in accordance with claim 1, wherein said charge trapping structure further comprises:

a first dielectric layer disposed on said second semiconducting layer;

a second dielectric layer disposed on said first dielectric layer; and

a third dielectric layer disposed on said second dielectric layer.

8. (original) The storage device in accordance with claim 7, wherein said first and third dielectric layers are formed from an inorganic dielectric material.

9. (original) The storage device in accordance with claim 7, wherein said first and said second dielectric layers form a charge trapping interface, whereby charge is trapped at said charge trapping interface.

10. (original) The storage device in accordance with claim 7, wherein said first and said third dielectric layers are formed from silicon oxide, and wherein said second dielectric layer is formed from silicon nitride.

11. (original) The storage device in accordance with claim 1, wherein said charge trapping structure further comprises nano-particles dispersed within a dielectric medium.

12. (original) The storage device in accordance with claim 11, wherein said nano-particles further comprise electrically conductive nano-particles.

13. (original) The storage device in accordance with claim 11, wherein said nano particles further comprise germanium nano-particles.

14. (original) The storage device in accordance with claim 1, further comprising:

a first electrical conductor electrically coupled to said first semiconducting layer; and

a second electrical conductor electrically coupled to said second semiconducting layer.

15. (original) The storage device in accordance with claim 1, further comprising a micromover coupled either to said conductive gate or to said charge trapping structure, wherein said micromover moves either said conductive gate or said charge trapping structure in at least one lateral dimension.

16. (original) The storage device in accordance with claim 15, wherein said micromover moves either said conductive gate or said charge trapping structure in at least one lateral dimension and said conductive gate is not in contact with said charge trapping structure.

17. (original) The storage device in accordance with claim 15, wherein said micromover moves either said conductive gate or said charge trapping structure laterally in two dimensions.

18. (original) The storage device in accordance with claim 15, wherein said micromover moves either said conductive gate or said charge trapping structure laterally in three dimensions.

19. (currently amended) The storage device in accordance with claim 15, wherein said micromover further comprises a tip actuator coupled to said conductive gate, wherein said tip actuator moves said conductive gate to control a distance between said conductive gate and said charge trapping storage structure.

20. (original) The storage device in accordance with claim 19, wherein said tip actuator moves said conductive gate in three mutually perpendicular directions.

21. (original) The storage device in accordance with claim 15, wherein said micromover further comprises:

a frame, wherein said micromover is configured to move relative to said frame; and

a mechanical suspension having a plurality of suspension subassemblies operatively coupled between said frame and said micromover, each suspension subassembly including:

at least one resilient mover flexure secured between said micromover and a coupling member, and

at least two resilient frame flexures secured between said coupling member and said frame, said frame flexures disposed on opposing sides of said mover flexure and aligned along a longitudinal axis passing through said mover flexure.

22. (original) The storage device in accordance with claim 21, wherein said coupling member of each of said suspension subassemblies tracks relative movement of said micromover in a first direction while remaining substantially independent of relative movement in a second direction perpendicular to said first direction.

23. (original) The storage device in accordance with claim 15, wherein said micromover further comprises:

a frame, wherein said micromover is configured to move relative to said frame, said micromover including a plurality of data locations accessible via operation of a read/write device; and

a mechanical suspension operatively coupled between said frame and said micromover, said mechanical suspension allowing planar movement of said micromover relative to said frame and substantially preventing out of plane relative movement, said planar movement defined by an X direction and a Y direction, said mechanical suspension including:

at least one X-axis flexure flexing in response to movement of the micromover in said X-direction relative to said frame, and

at least on Y-axis flexure flexing in response to movement of the micromover in said Y-direction relative to said frame.

24. (original) The storage device in accordance with claim 1, wherein said conductive gate further comprises:

a base structure having an outer surface; and

an outer layer disposed on said outer surface of said base structure.

25. (original) The storage device in accordance with claim 24, wherein said base structure is formed utilizing a conductive material, and wherein said outer layer is formed utilizing a dielectric material.

26. (original) The storage device in accordance with claim 24, wherein said base structure is formed utilizing a dielectric material, and wherein said outer layer is formed utilizing a conductive material.

27. (original) The storage device in accordance with claim 24, wherein said base structure is formed utilizing a first conductive material, and wherein said outer layer is formed utilizing a second conductive material, wherein said first and said second conductive materials are different.

28. (original) A storage device, comprising:

a p-doped semiconducting structure disposed on or in a substrate;

a substantially planar n-doped semiconducting structure disposed on said p-doped semiconducting structure forming a pn junction;

a charge trapping storage structure disposed on said n-doped semiconducting structure; and

a conductive gate, wherein said conductive gate is moveable relative to said charge trapping storage structure, wherein an electric field applied across said n-doped semiconducting structure, said p-doped semiconducting structure and said conductive gate generates trapped charge in said charge trapping storage structure.

29.-62. (cancelled).